CONFIDENTIAL

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

FEDERAL HOUSING FINANCE AGENCY, etc.,

Plaintiff,

v.

UBS AMERICAS, INC., et al.,

Defendants.

DECLARATION OF CHRISTOPHER M. JAMES, PH.D.

11 Civ. 5201 (DLC)

FEDERAL HOUSING FINANCE AGENCY, etc.,

Plaintiff,

v.

JPMORGAN CHASE & CO., et al.,

Defendants.

11 Civ. 6188 (DLC)

FEDERAL HOUSING FINANCE AGENCY, etc.,

Plaintiff,

v.

HSBC NORTH AMERICA HOLDINGS, INC., et al.,

Defendants.

11 Civ. 6189 (DLC)

FEDERAL HOUSING FINANCE AGENCY, etc.,

Plaintiff,

v.

BARCLAYS BANK PLC, et al.,

Defendants.

11 Civ. 6190 (DLC)

CONFIDENTIAL

FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. DEUTSCHE BANK AG, et al., Defendants.	11 Civ. 6192 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. FIRST HORIZON NATIONAL CORP., et al., Defendants.	11 Civ. 6193 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. BANK OF AMERICA CORP., et al., Defendants.	11 Civ. 6195 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. CITIGROUP INC., et al., Defendants.	11 Civ. 6196 (DLC)

CONFIDENTIAL

FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. GOLDMAN, SACHS & CO., et al., Defendants.	11 Civ. 6198 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. CREDIT SUISSE HOLDINGS (USA), INC., et al., Defendants.	11 Civ. 6200 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. NOMURA HOLDING AMERICA, INC., et al., Defendants.	11 Civ. 6201 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. MERRILL LYNCH & CO., INC., et al., Defendants.	11 Civ. 6202 (DLC)

CONFIDENTIAL

FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. SG AMERICAS, INC., et al., Defendants.	11 Civ. 6203 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. MORGAN STANLEY, et al., Defendants.	11 Civ. 6739 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. ALLY FINANCIAL INC., et al., Defendants.	11 Civ. 7010 (DLC)
FEDERAL HOUSING FINANCE AGENCY, etc., Plaintiff, v. GENERAL ELECTRIC COMPANY, et al., Defendants.	11 Civ. 7048 (DLC)

I, Christopher M. James, declare:

I. Qualifications

1. I am the William H. Dial/SunBank Eminent Scholar and Professor of Finance at the University of Florida. I am also a visiting scholar at the Federal Reserve Bank of San Francisco. Prior to joining the University of Florida faculty, I taught at the University of Oregon and the University of Michigan. I also have held positions at the Federal Reserve Bank of San Francisco, the Federal Deposit Insurance Corporation, and the Treasury Department. I served on SunTrust Bank of Florida's Advisory Board from 2002 through 2005; and on its Board of Directors from 1989 through 2002.

2. My academic research has focused on the areas of financial institutions, bank lending, mortgage lending, securities pricing, and corporate finance. I have published numerous articles on issues related to these topics. In research conducted while at the Federal Reserve, I have studied factors that affect the risk, pricing, and performance of mortgage loans and mortgage-backed securities. A copy of my curriculum vitae, which lists my publications, is attached as Appendix A.

3. I currently serve on the editorial boards of four scholarly journals, including the Journal of Financial Economics. From 1988 through 1999, I served as an associate editor of the Journal of Finance and as an editor of the Journal of Financial Intermediation.

4. I have served as an expert witness in cases involving mortgage loans, mutual funds, securities valuation, banking practices, public security offerings, alleged auditor malpractice, debt restructurings, and antitrust violations. A list of my prior testimony is attached as Appendix B.

II. Assignment

5. I have been asked by defense counsel to respond to the Proposed Sampling Protocol ("proposed protocol") that the Federal Housing Finance Agency ("FHFA") submitted to this Court on February 29, 2012. It is my understanding that FHFA is acting as conservator for the Federal National Mortgage Association ("Fannie Mae") and the Federal Home Loan Mortgage Corporation ("Freddie Mac"); and that in this capacity, FHFA has filed suits against UBS and fifteen other underwriters (the "Cases"). I understand that in each of the Cases FHFA alleges that the prospectuses and prospectus supplements relating to certain mortgage-backed securities purchased by Fannie Mae and Freddie Mac contained false and misleading statements and omissions concerning loan compliance with underwriting standards and guidelines.

6. Counsel has asked me to consider how FHFA's proposed protocol might apply to the Cases generally, using the UBS matter as a specific example. In particular, counsel has asked me to opine on the suitability of the proposed protocol for generating information to estimate loss causation and/or damages. I have based my analysis on the limited details provided in FHFA's proposed protocol.

7. In formulating my opinions, I have relied on my knowledge, prior experience, academic research and formal training in economics and finance. A list of documents, data and other information upon which I have relied is attached as Appendix C. My work in this matter is ongoing. This declaration is not intended to be and should not be treated as a final expert report; I have been asked to perform this assignment without the benefit of discovery or any expert submission by Plaintiff in these actions. I reserve the right to modify, amend, or supplement my analysis. I am being compensated in this matter at my regular hourly rate of $800. My compensation is not contingent upon the conclusions I reach or the outcome of this matter.

8. I have been told that Defendants' position is that adopting a sampling protocol for the purpose of limiting discovery is inappropriate and that the ultimate question of the appropriateness of a sampling methodology, if any, at trial should be decided after full discovery is completed and expert discovery on such issues is conducted. Separate from any sampling methodology, I have been told that Defendants' position is that limiting loan-level discovery only to the loans in whatever sample is chosen improperly and unfairly would interfere with Defendants' ability to present their statutory due diligence defense. I likewise have been told that, to the extent Defendants performed due diligence on a subset of loans for the certificates at issue, Defendants may offer evidence of that diligence in support of their due diligence defense. I have been told that Defendants specifically object to any use of sampling that would deprive them of the ability to examine or challenge Plaintiff's evidence at trial, including (i) evidence derived from sampling and any attempt to extrapolate conclusions from a sample; or (ii) evidence relating to the issues in these Cases, including issues relating to due diligence, loss causation or damages.

9. Notwithstanding those objections, Defendants have asked me to opine on the issues noted above. Without the benefit of full discovery, I cannot determine with any certainty whether any sampling methodology implemented today will be adequate for any purpose relevant to this litigation, and nothing in this declaration is intended to exclude the possibility that any sampling that is performed may be inadequate.

III. Summary of Opinions

10. Numerous factors affect a loan's default risk. These factors include, among other things, (1) borrower characteristics such as credit history (FICO score), income, and occupation (*e.g.*, salaried or self-employed), (2) property characteristics such as the type of property (*e.g.*, single family or condominium), occupancy status

(*e.g.*, owner occupied or rental), property value, and geographic location, (3) loan characteristics such as the size of the loan, the purpose of the loan (*e.g.*, refinance or purchase), the type or structure of the loan (*e.g.*, adjustable or fixed rate, amortization schedule), and the required level of documentation, and (4) local market conditions at the time of origination and thereafter. Loan officer judgment and "soft" qualitative information should also be reviewed and included in risk assessment.

11. One reason loan qualitative factors need to be reviewed is that the application of underwriting standards does not generally imply that each specific criterion is satisfied individually. A loan is generally considered to comply with underwriting standards even if one or more specific criteria are not satisfied, as long as other factors compensate for the criteria that were not satisfied. Given that compensating factors are likely to be present when a specific underwriting criterion is not satisfied, there is a likelihood that a reviewer might identify a breach when re-underwriting a loan that may be related to risk factors that are associated with the probability of default. A sufficiently large sample of loans will therefore be needed to ascertain whether compensating factors are systematically related to noncompliance with one or more underwriting criteria.

12. Any assessment of loss causation and/or damages may require a sufficiently large sample of loans to separate out losses attributable to factors as to which Defendants allegedly made material misstatements from those attributable to other factors, such as the deterioration in the economic environment that began in 2007. In other words, estimation of damages or loss causation may require consideration of a "but for" world in which the breaches did not occur, which is one of several ways of showing that the purported breaches did not cause Plaintiff's losses

13. An appropriate assessment of damages based on a "but for" world methodology would likely require a substantially larger sample than that proposed by FHFA. This is because FHFA's proposal is based on only a few factors, but loan

performance is affected by numerous factors that interact in complex ways. If loan file discovery is limited to FHFA's sample, there may not be sufficient discovery for purposes of loss causation and/or damages.

14. While I expect that larger samples will be required to assess loss causation and/or damages than to assess liability, whether this is in fact the case cannot be determined at present. Rather, such determination hinges on analysis that FHFA has yet to perform of the incidence of breach in the sample populations.

IV. Overview of Factors Affecting Loan Default Risk

15. I use the term "default risk" to refer to the risk of loss to the lender or its assignee from a loan default, which depends on the likelihood of default as well as the severity of loss in the event of default. A number of factors affect a loan's default risk, and mortgage originators generally consider such factors when evaluating how to price loans. Some of the factors commonly considered are called "hard" factors, since they typically are well-defined numerical or categorical variables that are relatively easy to measure and to capture in loan-level datasets. "Hard" factors fall into three broad categories:

    a) Borrower Characteristics, which include factors such as credit history (FICO score), income (including debt-to-income ratio), and occupation (*e.g.*, salaried or self-employed);
    b) Loan Characteristics, which include factors such as the size of the loan, the purpose of the loan (*e.g.*, refinance or purchase), the type or structure of the loan (*e.g.*, adjustable or fixed rate, amortization schedule), and the level of documentation used to verify income and employment; and
    c) Property Characteristics, which include factors such as property location, type of property (*e.g.*, single family or condominium), and occupancy status (*e.g.*, owner occupied or rental).

16. For example, the prospectus supplement for securitization MABS 2007-HE2 includes a description of the underwriting standards generally applied by Option One Mortgage Corporation, which originated 57.5% of the loans underlying the certificates. The non-exhaustive list of the "hard factors" considered by Option One includes "credit score," "LTV" (a combination of the loan and property characteristics), "debt service to income ratio," and "verification or evaluation" of income. (MABS 2007-HE2 Pro. Supp., "The Originators".)

17. The "hard" factors commonly considered in originators' loan risk assessments are consistent with those academic researchers have identified as determinants of mortgage loan defaults.[1] Numerous academic studies, including Ashcraft and Schuermann (2008), Ashcraft, Goldsmith-Pinkham, and Vickery (2010), Bhardwaj and Sengupta (2010), and Demiroglu and James (2010) have included such "hard" factors in models that predict mortgage loan defaults.[2] These factors have also been used by rating agencies (see Cao, Gillis, Mason, Parisi, and Wang (2009)) in evaluating mortgage credit risk.[3]

18. In addition to "hard" factors, loan decisions are also affected by "soft" factors, which are not well-defined and measurement of which involves subjective elements. Originators' underwriting guidelines often give the loan officer discretion to use "soft" factors in considering whether to approve loans for which the borrower does not meet all of the "hard" factor criteria.

---

[1] Another risk factor is the quality and characteristics of the first lien loan that has priority over the second lien loan on the same collateral.

[2] Ashcraft, Adam, and Til Schuermann, "Understanding the Securitization of Subprime Mortgage Credit," *Federal Reserve Bank of New York, Staff Report* No. 318, March 2008; Ashcraft, Adam, Paul Goldsmith-Pinkham, and James Vickery, "MBS Ratings and the Mortgage Credit Boom," *Federal Reserve Bank of New York, Staff Report* No. 449, May 2010; Bhardwaj, Geetesh, and Rajdeep Sengupta, "Where's the Smoking Gun? A Study of Underwriting Standards for US Subprime Mortgages." *Federal Reserve Bank of St. Louis, Research*, Working Paper 2008-036D; Demiroglu, Cem and Christopher M. James. "How Important is Having Skin in the Game? Originator-Sponsor Affiliation and Losses on Mortgage-Backed Securities." Review of Financial Studies, forthcoming.

[3] Cao, B., Gillis, T. G., Mason, S., Parisi, F., Wang, J., "US RMBS Rating Methodology and Assumptions for Prime Jumbo, Alternative–A and Subprime Loans." *S&P Ratings Direct*, May 15, 2009.

19. For example, the prospectus supplement for securitization MABS 2007-HE2 also states that Option One borrowers could qualify for exceptions from underwriting standards in the presence of certain "soft factors," including: "a maximum of one 30-day late payment on all mortgage loans during the last 12 months; stable employment; a fixed source of income that is greater than 50% of all income; ownership of current residence of four or more years; or cash reserves equal to or in excess of three monthly payments of principal, interest, taxes and insurance". (MABS 2007-HE2 Pro. Supp., "The Originators".)

20. As one group of researchers noted, "[t]he lender expends effort to process the soft and hard information about the borrower and, based on this assessment, offers a menu of contracts to the borrower".[4] Because "soft" factors are not captured in broad datasets such as loan tapes, they may be difficult to observe without a review of individual loan files.

V. FHFA's Proposed Sampling Protocol

21. FHFA's stated purpose in suggesting the use of sampling rather than analysis of all loans underlying the securitizations at issue in these Cases is to "insure that discovery is manageable in scope". (p. 2) FHFA claims that it would be feasible and appropriate to use the proposed protocol to assess both liability and damages in each of the Cases. With respect to liability, FHFA's proposed protocol offers the following plan:

> [A]fter representative samples are selected, FHFA will: (1) analyze each loan file in the sample to identify loans originated in violation of the originator's underwriting guidelines, false statements of owner-occupancy rates, and false statements of LTV ratios; and (2)

[4] "Our findings . . . suggest that the role of soft information is crucial to understanding what worked and what did not in the existing securitized subprime loan market." Keys, Benjamin J., Tanmoy Mukherjee, Amit Seru, and Vikrant Vig. "Did Securitization Lead To Lax Screening? Evidence from Subprime Loans," *The Quarterly Journal of Economics*, February 2010; see also Rajan, Uday, Amit Seru, and Vikrant Vig, "The Failure of Models That Predict Failure: Distance, Incentives and Default," *Working paper*, University of Chicago, 2009.

> extrapolate from each sample the incidence of such defects and false statements across the corresponding population. (p. 6) …
>
> Upon examining data obtained from the loan tapes and the originator information, FHFA will consider stratifying each sample based on the following factors among others: reported LTV/Combined LTV ("LTV"), loan performance, documentation type, occupancy type, and FICO score. (p. 9) …
>
> FHFA will also evaluate the possible use of clustering … of securitizations within a Case. … Clusters could be organized if the loan groups of more than one securitization are sufficiently homogeneous as to key factors. For example, FHFA will consider whether to propose clustering securitizations where the originator or major originators were the same and the loans were originated during the same timeframe. (pp. 9–10)

22. With respect to damages, the proposed protocol asserts only that: "Sampling and extrapolation are also relevant to calculating damages on claims alleged in each of the Complaints." (p. 6)

23. I consider FHFA's proposed protocol and the effect of limiting discovery in accordance with the proposal on the loss causation and damages portions of the Cases.

VI. The proposed protocol is likely to yield inadequate sample sizes for assessment of loss causation or damages.

24. The data requirements for assessing loss causation and damages would extend substantially beyond those for assessing whether there had been material misrepresentations (or "breach"). Any assessment of either loss causation or damages would require focusing on the performance of the loans underlying a given certificate and separating out the part of performance attributable to breaches from the part attributable to other factors, such as the deterioration in the economic environment that began in 2007. In other words, estimation of loss causation or

damages would require consideration of a "but for" world in which the breaches did not occur.

25. To perform a statistically reliable "but for" world analysis that takes account of the complex interactions among the numerous factors that affect loan performance would require a loan sample of substantial size. It is widely recognized that measurement error and omission of relevant information can lead to unreliable statistical results. In addition, because lending decisions are often based on loan officer judgment and "soft" qualitative information, statistical models cannot be employed without careful examination of individual loan files for a sufficiently large sample of loans.

26. In order to perform a loss causation or damages analysis with the necessary statistical precision, Defendants will require flexibility to sample more loans than called for in Plaintiff's proposal.

A. The "hard" and "soft" factors relevant to default risk interact in a complex, non-linear manner.

27. As noted above (¶¶ 15–19), both "hard" and "soft" factors affect default risk. Since credit risk is multidimensional, these "hard" and "soft" factors interact in complex non-linear ways to determine *ex ante* loan risk and *ex post* loan outcomes. This is because lenders choose what they believe to be the best loan package by trading off different characteristics such as debt-to-income ratio and documentation. For example, a lender may trade off borrower weakness in one dimension (*e.g.*, high debt-to-income ratio) for strength on another dimension (*e.g.*, high FICO score). Lenders may also adjust their loan pricing for particular mixes of loan, property, and borrower characteristics.

28. Bhardwaj and Sengupta (2010) describe the interaction of risk factors:

> [There are] two important features of credit risk .... The first takes into account the multidimensional nature of credit risk: It is often possible to compensate for the increase in the ex-ante risk of one borrower attribute by raising the requirement standards along another dimension. The second involves the idea that while both borrower attributes and mortgage characteristics determine credit risk, the terms and conditions on the latter are largely determined by the former....
>
> [W]e show that the changes in mortgage underwriting do not explain widespread defaults...in the subprime mortgage market. Our results show that while underwriting declined on certain dimensions, a multidimensional study of underwriting fails to provide evidence of a secular decline in underwriting standards.

29. Borrower, property, and loan characteristics can interact in a complex fashion. For example, originators tend to charge higher rates to borrowers with lower credit (FICO) scores. But these rate differentials may be smaller for loans with higher loan-to-value (LTV) ratios. Similar interactions are found among other variables. In addition, lenders' expectations regarding future housing prices in a geographical region typically vary according to past house price trends in that region. Hence, loan risk also depends on the interaction of geography and history. A statistical model that ignores such interactions will produce biased results.[5]

[5] "Failure to account for nonlinearities can lead to either overstatement or understatement of the effect of a change in the value of an explanatory variable on the dependent variable. One particular type of nonlinearity involves the interaction among several variables. An interaction variable . . . allows the expert to take into account the possibility that the effect of a change in one variable on the dependent variable may change as the level of another explanatory variable changes." Daniel L. Rubinfeld (2000). "Reference Guide on Multiple Regression," in *Reference Manual on Scientific Evidence*, Washington: Federal Judicial Center, 1994. Second Edition 2000.

B. Academic studies highlight the complexity of interactions among loan risk factors and the difficulty in measuring many of them.

30. Academic studies have found that "hard" factors (*i.e.,* loan, property, and borrower characteristics that are measurable and included in datasets) are correlated with only a small fraction of the incidence of default in mortgage loans.[6] Haughwout, Peach, and Tracy (2008) note that "despite our rich set of covariates, much of the increase remains unexplained, even in retrospect. Thus, the fact that the credit markets seemed surprised by the rate of early defaults in the 2006 and 2007 nonprime vintages becomes more understandable."

31. These studies highlight the large number of potential risk factors and their complex interactions, as discussed above. They also speak to the loan-specific nature of default, which is often related to idiosyncratic events such as a death in the family, divorce, illness, or job loss, and difficult to predict based solely on "hard" factors. "Soft" factors typically omitted from datasets and statistical analyses, such as employment stability and past mortgage repayment history, may be necessary to estimate the likelihood of default more accurately.

32. The fact that lenders commonly trade off the risk of one borrower attribute by raising requirement standards along other dimensions means that assessment of loss causation or damages will not be straightforward. Rather, it is an exercise that will require particular attention to the complexity of such interactions. Because these trade-offs will not be apparent at an aggregate level, they will generally require analysis of a larger sample of loans than that proposed by Plaintiff. This is especially the case with "soft" factors that affect loan risk and pricing, such as local market conditions at the time of origination.

---

[6] Demiroglu, Cem and Christopher M. James. "How Important is Having Skin in the Game? Originator-Sponsor Affiliation and Losses on Mortgage-Backed Securities." Review of Financial Studies, forthcoming; Ashcraft, Adam, Paul Goldsmith-Pinkham, and James Vickery, "MBS Ratings and the Mortgage Credit Boom," *Federal Reserve Bank of New York, Staff Report* No. 449, May 2010; Haughwout, Andrew F., Richard W. Peach, and Joseph S. Tracy. 2008. "Juvenile Delinquent Mortgages: Bad Credit or Bad Economy?" *Federal Reserve Bank of New York, Staff Report* No. 341, August 2008.

C. The loans underlying the UBS securitizations vary widely on important risk characteristics; and such heterogeneity may require sample sizes larger than those envisioned by the proposed protocol.

33. Statistical analysis *can* be used to assess loss causation and/or damages in these Cases. The reason for this is that in order to make such assessments, one need not fully explain the causes of default. Rather, the relevant question in a negative loss causation or damages context is a much narrower one: What part of the performance of the breached loans at issue mirrors that of loans that are sufficiently similar except for the breach?

34. There are a number of ways that one could proceed in attempting to answer this question. But in all cases, the benchmark should be consideration of a "but for" world in which the breaches did not occur. Implementation of any "but for" world methodology would require loan samples that were sufficiently large to yield statistically significant, and therefore defensible, conclusions.

35. The sample size needed to yield statistically significant results for the loss causation or damages analysis will vary by certificate and may very well differ from that required for the liability analysis. Moreover, the sample sizes that will be required for the loss causation and damages analyses are unknowable at this time. They will depend on both the initial findings concerning the incidence of alleged breach in the underlying loan population as well as the type of "but for" world analyses employed.

36. A key factor in determining the sample sizes needed to estimate loss causation or damages in these Cases will be the composition of the loan pool underlying each certificate. The greater the variation of loan characteristics in a specific loan pool, the larger the required sample.[7]

[7] See, for example, Dehejia, Rajeev H., and Sadek Wahba, "Propensity Score-Matching Methods for Nonexperimental Causal Studies," Review of Economics and Statistics, February 2002 84(1) 151-161.

37. As noted above, there are a number of borrower, property, and loan characteristics that affect the risk associated with a loan. I collected data on several of these variables from the ABSNet Loan database for the relevant loan pools underlying each of the UBS-sponsored certificates at issue.[8]

38. Exhibits 1 and 2 display information on characteristics of the loans in each pool. As these statistics illustrate, the loans within and across these pools vary widely on many of the risk factors listed above. For example, with respect to variation just within the ARSI 2006-W3 certificate, Exhibit 1 shows that:

    a) 39.7% of the loans in ARSI 2006-W3 were originated for the purpose of purchasing a property, 54.5% were cash-out refinance transactions, and 5.8% were rate refinance transactions. Studies show that mortgage loans that are taken for the purpose of purchase are less likely to default than those taken to refinance.[9]

    b) 76.3% of loans were for single-family properties, while the remaining loans were for 2–4 unit properties, condominiums, and planned unit developments.

    c) Over one-third of the loans were for properties located in the states of Arizona, California, Florida, and/or Nevada. These "distressed states" experienced double digit house price appreciation over the period 2001–

---

[8] ABSNet Loan provides loan level data for mortgages and home equity loans. http://www.lewtan.com/products/ABSNetloan_US.pdf. The data analyzed here are for those loans included in the loan pools underlying the certificates purchased by Fannie Mae and/or Freddie Mac. The loan tape files provided by Counsel for ARSI 2006-W3, MABS 2005-FRE1, MABS 2005-HE2, MARM 2005-8, MARM 2006-OA1, and MARM 2007-1 were used to reduce the amount of missing loan characteristic information.

[9] Demiroglu, Cem and Christopher M. James. "How Important is Having Skin in the Game? Originator-Sponsor Affiliation and Losses on Mortgage-Backed Securities." Review of Financial Studies, forthcoming.

2006 and a sharp decline in house prices in 2007.[10] The pre loan-origination default risk of loans attributed to loan applications in these states may have been higher if lenders had anticipated the reversal in the price trend. In my own research, I have found that a decline in house prices is associated with higher incidence of mortgage default.[11] Haughwout, Peach, and Tracy (2008) find a similar relationship.

d) 15.4% of loans in the pool were for 30-year fixed-rate loans, while over 80% of loans in the pool had interest rates that would reset within 2–3 years.

39. The substantial heterogeneity in factors seen for certificate ARSI 2006-W3 is also present in the other UBS-sponsored securitizations. And the greater the variation within a given loan pool, the larger the sample likely to be required for purposes of assessing loss causation and damages. The reason for this is that one needs to match allegedly breaching loans to non-breaching loans that are similar in terms of other risk factors.[12]

40. Another factor that must be taken into account in any analysis of loss causation or damages is loan vintage. As shown in Exhibit 2, the loan pools underlying the UBS-sponsored securitizations included loans originated anywhere between August 2003 and June 2007.[13] The loans in some pools were all originated within a few months of each other, while the loans within other pools were originated

---

[10] Haughwout, Andrew F., Richard W. Peach, and Joseph S. Tracy. 2008. "Juvenile Delinquent Mortgages: Bad Credit or Bad Economy?" *Federal Reserve Bank of New York, Staff Report* No. 341, August 2008.
[11] Demiroglu, Cem and Christopher M. James. "How Important is Having Skin in the Game? Originator-Sponsor Affiliation and Losses on Mortgage-Backed Securities." Review of Financial Studies, forthcoming; Haughwout, Andrew F., Richard W. Peach, and Joseph S. Tracy. 2008. "Juvenile Delinquent Mortgages: Bad Credit or Bad Economy?" *Federal Reserve Bank of New York, Staff Report* No. 341, August 2008.
[12] See, for example, Dehejia, Rajeev H. and Sadek Wahba, "Propensity Score-Matching Methods for Nonexperimental Causal Studies," Review of Economics and Statistics, February 2002 84(1) 151-161.
[13] This statement excludes thirteen loans for which ABSNet Loan reports origination dates between 1991 and 1997.

over a longer period of time. Academic studies, including my own, have found that the incidence of default varies by vintage.[14]

41. The factors listed above, as well as others, are all important determinants of default risk. Risk evaluation and loan pricing are therefore multi-dimensional exercises that involve the consideration of interactions between a number of variables. It would be incorrect to omit any factor on the assumption that its effect on loan performance is subsumed by other factors. Rather, all factors, as well as their different combinations, must be considered in any analysis of loss causation or damages. As noted, this fact will tend to increase the sample size needed for analysis of loss causation or damages.

42. To make the discussion more concrete, consider one potential analytical technique—Propensity Score Matching (PSM)—a technique that I have used in my own research on the factors related to mortgage defaults.

43. While, at this early stage, I cannot determine the appropriate analytical technique to use, if I were to apply PSM to the present case, the goal would be to control for the confounding effects of the numerous borrower, loan, and property characteristics that affect default risk as well as for general systemic risk factors that affect loss rates on both breaching and non-breaching loans. Controlling for these factors would allow one to isolate that portion of loan losses actually attributable to breach.

---

[14] "[B]eginning with the 2005 vintage the performance of nonprime mortgage loans became notably worse than previous vintages." Haughwout, Andrew F., Richard W. Peach, and Joseph S. Tracy. 2008. "Juvenile Delinquent Mortgages: Bad Credit or Bad Economy?" *Federal Reserve Bank of New York, Staff Report* No. 341, August 2008. In my own research, I find that the causes of default are not constant, but vary over time. For example, as a general matter, losses from default as of 2009 are more closely related to changes in housing prices than losses as of July 2006. Demiroglu, Cem and Christopher M. James. "How Important is Having Skin in the Game? Originator-Sponsor Affiliation and Losses on Mortgage-Backed Securities." Review of Financial Studies, forthcoming. Other studies have found similar results: "[B]oth the set of factors that are significant to default and the default sensitivity of those significant default risk factors are very different among the [2000, 2003, and 2006 vintage] . . . samples." An, Xudong, Vincent W. Yao, Yongheng Deng, and Eric Rosenblatt, "Model Stability and the Subprime Mortgage Crisis," Institute of Real Estate Studies, IRES Working Paper Series, 2009.

44. The PSM technique would make use of data from the available loan sample in three steps. First, by taking account of information about all loans in the sample, a statistical model would be used to develop an algorithm for assigning a value to each loan in the sample, based on its observable characteristics.[15] Second, for each of the allegedly breaching loans identified by the Plaintiff, a matching loan would be drawn from the sample that had the same value but was in fact a non-breaching loan. At the end of this second step, there would be a matched set of allegedly breaching and non-breaching loans. Third, statistical analysis would be used to isolate the difference in loan performance between the two sets of loans, which would serve as an estimate of the portion of the allegedly breaching loans' performance attributable to breach as opposed to other factors.

45. To the extent the PSM technique would be considered for use in the present Cases, the loan samples available for analysis would have to be sufficient in at least two ways. First, effective implementation would require a sufficiently large sample of loans to develop a well-specified statistical model, especially given the number of factors that affect default risk and the complex interactions among them. Second, the loan sample used would have to be sufficiently large to enable identification based on propensity scores of non-breaching loans that match each of the breaching loans.

46. PSM is only one of various techniques that might be considered for use in assessing loss causation or damages. But it does serve to illustrate two important points: that one must control for other factors to identify accurately the actual impact of an alleged breach; and that the findings of alleged breach by Plaintiff's experts in the first instance will affect the sample size needed for assessment of loss causation or damages by Defendants.

[15] Either a "logit" or "probit" model could be used for this purpose. Both allow one to estimate the probability of an outcome among two or more possible outcomes given a set of explanatory factors.

VII. Conclusion

47. For the reasons discussed above, the proposed protocol may produce samples that are insufficient for the purposes of estimating loss causation or damages. Whether this is in fact the case cannot be known until after the alleged incidence of breach in the sample populations has been established.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 6, 2012

CHRISTOPHER M. JAMES, Ph.D.